

What is claimed is:

1. A cold trap, comprising:  
cold trapping surfaces to prevent migration of lubrication molecules that are  
5 not deposited onto storage discs during a vapor lubrication process from a vapor  
lubrication station to adjacent process and/or transport chambers.
2. The cold trap of claim 1, wherein the cold trapping surfaces prevent  
migration of the lubrication molecules to the adjacent process and/or transport  
10 chambers during transfer of the storage discs from upstream processes to the vapor  
lubrication station and/or during transfer of the storage discs from the vapor  
lubrication station to downstream processes.
3. The cold trap of claim 1, wherein the cold trapping surfaces are held under  
15 low working pressure by means of high performance vacuum pumps.
4. The cold trap of claim 3, wherein the cold trapping surfaces are cooled using  
refrigerants selected from the group consisting of liquid nitrogen, low-temperature  
refrigerant, cold water, and cold air.  
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5. The cold trap of claim 3, further comprising:  
one or more temperature sensors to sense the temperature of the cold trapping  
surfaces and to output a signal proportional to the sensed temperature; and  
a control circuitry coupled to the temperature sensors to monitor the  
25 temperature of the cold trapping surfaces by receiving the signal from the  
temperature sensors, and further to automatically shut-off the operation of the vapor  
lubrication station to prevent accidental migration of lubrication molecules in case of  
a failure in the cold trap.

6. A vapor lubrication station, comprising:  
one or more cold traps to prevent migration of lubrication molecules that are  
not deposited onto storage discs during a vapor lubrication process from the vapor  
5 lubrication station into adjacent process chambers.

7. The vapor lubrication station of claim 6, wherein the adjacent process  
chambers comprise:  
adjacent process chambers to deposit successive layers onto the storage discs  
10 to produce discs, and/or transport chambers used in transporting the storage discs  
between the process chambers.

8. The vapor lubrication station of claim 6, wherein the cold traps to  
prevent migration of the lubrication molecules during the transporting of storage  
15 discs prevent migration of the lubrication molecules to the adjacent process  
chambers during transferring of the storage discs from upstream processes to the  
vapor lubrication station and/or during transferring of the storage discs from the  
vapor lubrication station to downstream processes.

20 9. The vapor lubrication station of claim 8, wherein transferring the storage  
discs comprises:  
transferring the storage discs using disc-handling systems selected from the  
group consisting of transport mechanisms, conveyors, lifters, and one or more  
cassettes.

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10. The vapor lubrication station of claim 6, further comprising:

one or more entry/exit ports disposed between the vapor lubrication station and/or the adjacent process chambers, wherein the one or more cold traps are disposed around the one or more entry/exit ports, respectively.

- 5     11.     The vapor lubrication station of claim 10, wherein the one or more entry exit ports comprise:  
             gates and/or valves that open and close to receive and output the discs.
- 10     12.     The vapor lubrication station of claim 6, wherein the vapor lubrication station is held under low working pressure in the range of about  $5 \times 10^{-5}$  to  $5 \times 10^{-9}$  Torr by means of high performance vacuum pumps.
- 15     13.     The vapor lubrication station of claim 6, wherein the cold traps comprise:  
             cold trapping surfaces to prevent migration of lubrication molecules that are not deposited onto the disc into the adjacent process chambers.
- 20     14.     The vapor lubrication station of claim 13, wherein the cold trapping surfaces are cooled to have a temperature in the range of about  $-195^{\circ}\text{C}$  to  $25^{\circ}\text{C}$  using refrigerants selected from a group consisting of liquid nitrogen, low-temperature refrigerant, and cold water.
- 25     15.     The vapor lubrication station of claim 13, further comprising:  
             one or more temperature sensors to sense the temperature of the cold trapping surfaces and to output a signal proportional to the sensed temperature; and  
             a control circuitry coupled to the temperature sensors to monitor the temperature of the cold trapping surfaces by receiving the signal from the temperature sensors, and further to automatically shut-off the operation of the vapor

lubrication station to prevent accidental migration of lubrication molecules due to a failure in the operation of the cold traps.

16. A method of preventing migration of lubrication molecules into adjacent  
5 process chambers from a vapor lubrication station, comprising:
- (a) trapping lubrication molecules that are not deposited onto storage discs during the vapor lubrication process in the vapor lubrication station using one or more cold traps including cold trapping surfaces.
- 10 17. The method of claim 16, wherein trapping the lubrication molecules comprises:
- (a)(1) trapping the lubrication molecules during transfer of the storage discs from upstream processes to the vapor lubrication station and/or further during transfer of the storage discs from the vapor lubrication station to downstream  
15 processes.
18. The method of claim 16, further comprising:
- (b) sensing the temperature of the cold trapping surfaces;
- (c) monitoring the sensed temperature; and  
20 (c) shutting down the vapor lubrication station to prevent accidental migration of lubrication molecules into the adjacent process chambers based on the outcome of the monitoring.
19. The method of claim 16, wherein cold trapping surfaces are cooled using  
25 refrigerants selected from the group consisting of liquid nitrogen, low-temperature refrigerant, cold water, and cold air.
20. A vapor lubrication station, comprising:

means to deposit lubrication molecules onto storage discs; and

means to prevent migration of lubrication molecules that are not deposited onto storage discs during a vapor lubrication process in the vapor lubrication station into adjacent process chambers and/or transport chambers.

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